# CHLORINE

Also known as: Chlorine gas, Bertholite, Caswell No. 179
Chemical reference number (CAS): 7782-50-5

## WHAT IS CHLORINE?

Chlorine is a poisonous, greenish-yellow gas described as having a choking odor. It is a very corrosive, hazardous chemical. Usually combined with other chemicals, it is used to disinfect water, purify metals, bleach wood pulp and make other chemicals.

Household bleach, used to whiten fabrics or remove mold from surfaces, is a 5% solution of a stabilized form of chlorine.

**Do Not Mix household bleach with acid-containing or ammonia-containing cleaners. Dangerous levels of a very harmful gas can be released.**

Most of the chlorine that enters lakes, streams, or soil evaporates into the air or combines with other chemicals into more stable compounds. Chlorine-containing chemicals that seep through soil down into groundwater can remain unchanged for many years.

## HOW ARE PEOPLE EXPOSED TO CHLORINE?

Exposures to chlorine gas are usually due to industrial processes or accidental spills. Chlorine is added in small amounts to some municipal water supplies when bacteria contamination threatens public health. When chlorine combines with lake or river water, a class of chemicals that includes chloroform can be formed. (See **chloroform** fact sheet)

**Breathing**: Most high-level exposure occurs in workplaces where chlorine is used. People may inhale chlorine by using chlorine bleach or by living near an industry that uses chlorine.

The smell from treated drinking water or swimming pools may be irritating but isn't usually harmful.

**Drinking/Eating**: Low level exposure can occur when water containing chlorine is used for drinking or for food preparation.

**Touching**: The body does not absorb chlorine well. However, small amounts can pass through the skin when people are exposed to chlorine gas, chlorine bleach, or bathing in water with high levels of chlorine. Lower levels of exposure can occur when people handle soil or water containing chlorine.

## DO STANDARDS EXIST FOR REGULATING CHLORINE?

**Water**: The proposed federal drinking water standard for chlorine is 4 parts per million (ppm). Many city water supplies are treated with chlorine to reduce the possible spread of bacterial disease. The system operators are required to maintain a detectable level of chlorine in the piping system. We suggest you stop drinking water that contains more than 4 ppm of chlorine on a regular basis.

**Air**: No standards exist for the amount of chlorine allowed in the air of homes. We use a formula to convert workplace limits to home limits. Based on the formula, we recommend levels be no higher than 0.01 ppm of chlorine in air. Most people can smell chlorine when levels reach 0.02-3.4 ppm. If you can smell chlorine in your home, the level may be too high to be safe.

The Wisconsin Department of Natural Resources regulates the amount of chlorine that can be released by industries.

## WILL EXPOSURE TO CHLORINE RESULT IN HARMFUL HEALTH EFFECTS?

**Short-term, high-level exposures**
Immediately or shortly after exposure to 30 ppm or more of chlorine gas, a person may have chest pain, vomiting, coughing, difficulty breathing, or excess fluid in their lungs. Exposure to 430 ppm in air for 30 minutes will cause death.

The health effects of breathing air that has less than 30 ppm of chlorine are the same as listed below for inhaling liquid bleach vapors.

Liquid chlorine bleach and its vapors (at levels of 3-6 ppm in air) are irritating to eyes. At levels of 15 ppm in air people experience nose and throat irritation. Touching liquid chlorine bleach can cause skin irritation. Drinking levels over 4 ppm can cause throat and stomach irritation, nausea and vomiting.

**Long-term, low-level exposure**
The following health effects can occur after several years of exposure to chlorine:
**Organ Systems**: The main effects of exposure to chlorine gas include diseases of the lung and tooth corrosion. People with previous lung disease, smokers, and those with breathing problems are more sensitive to chlorine.

**Cancer**: There is no information currently available about whether chlorine causes cancer.

**Reproductive Effects**: No reproductive effects from chlorine exposure have been reported.

In general, chemicals affect the same organ systems in all people who are exposed.
A person's reaction depends on several things, including individual health, heredity, previous exposure to chemicals including medicines, and personal habits such as smoking or drinking.
It is also important to consider the length of exposure to the chemical; the amount of chemical exposure; and whether the chemical was inhaled, touched, or eaten. People with preexisting lung or heart disease may be particularly sensitive to the effects of chlorine.

## CAN A MEDICAL TEST DETERMINE EXPOSURE TO CHLORINE?

By testing lung function and examining your skin and teeth, your doctor can evaluate the health effects of chlorine exposure.

*Seek medical advice if you have any symptoms that you think may be related to chemical exposure.*

This fact sheet summarizes information about this chemical and is not a complete listing of all possible effects. It does not refer to occupational exposure or emergency situations.

## FOR MORE INFORMATION

- Poison Control Center, 800-815-8855
- Your local public health agency
- Division of Public Health, BEH, 1 West Wilson Street, Rm. 150, Madison, WI 53701-2659, (608) 266-1120 or Internet: http://www.dhfs.state.wi.us/eh

Prepared by the
Wisconsin Department of Health and Family Services
Division of Public Health, with funds from the
Agency for Toxic Substances and Disease Registry,
Public Health Service,
U.S. Department of Health and Human Services.

(POH 4756 *Revised* 12/2000)